

REMARKS

An excess claim fee payment letter is submitted concurrently herewith to cover the cost of two (2) excess dependent claims.

Claims 1-28 and 35-39 are all the claims presently pending in the application. Claims 1-2, 5-7, 9-13, 15-16, 19-28 and 35 have been amended to more particularly define the invention. Claims 38-39 have been added to claim additional features of the claimed invention.

It is noted that the claim amendments are made only for more particularly pointing out the invention, and not for distinguishing the invention over the prior art, narrowing the claims or for any statutory requirements of patentability. Further, Applicant specifically states that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claims 35-37 stand rejected upon informalities (e.g., 35 U.S.C. § 112, second paragraph). Claims 1-28 stand rejected under 35 U.S.C. § 102(a) as being anticipated by Kagami et al. (JP 2000-347043). Claims 1-28 stand provisionally rejected under 35 U.S.C. § 102(e) as being anticipated by co-pending U. S. Pat. Application No. 09/534,458 (hereinafter the “458 Application”).

Claims 35 and 37 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over (JP 08-320422) (hereinafter “JP ‘422”) in view of Anderson (U.S. Patent No. 4,969,702). Claims 35-37 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over JP ‘422 in view of Anderson and Kagami et al.

The Examiner further alleges that claims 1-28 conflict with claims 1-8 and 11 of the ‘458 Application. He also indicates that claims 1-28 are directed to the same invention as that of claims 1-8 and 11 of the ‘458 Application. Claims 1-28 also stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-8 and 11 of the ‘458 Application.

These rejections are traversed in view of the following discussion.

I. THE CLAIMED INVENTION

Applicant's invention is directed to a method for manufacturing an optical transmission device which includes mixing a first photosetting resin comprising a first photopolymerization initiator and a first monomer or oligomer to be polymerized in a first polymerization type by the first photopolymerization initiator, and a second photosetting resin comprising a second photopolymerization initiator and a second monomer or oligomer to be polymerized in a second polymerization type that is different from the first polymerization type by the second photopolymerization initiator.

The method also includes forming a core portion of the optical transmission device by hardening the first photosetting resin by making a first irradiation that activates the first photopolymerization initiator but does not activate the second photopolymerization initiator; and forming a clad portion of the optical transmission device by hardening both the first photosetting resin and the second photosetting resin by making a second irradiation that activates both the first and second photopolymerization initiators.

In one aspect of the invention, as recited, for example, in claim 1, the first irradiation has a wavelength shorter than the longest wavelength required to activate the first photopolymerization and longer than the longest wavelength required to activate the second photopolymerization. In addition, one of the first polymerization type and the second polymerization type includes radical polymerization, and the other includes cationic polymerization.

In another aspect of the invention, as recited for example, in claim 15, the first irradiation has an amount of exposure more than the minimum amount of exposure required to harden the first photosetting resin substantially completely and smaller than the maximum amount of exposure not to harden the second photosetting resin completely.

Another aspect of the invention, as recited, for example, in claim 35, is directed to a method for forming an optical transmission device within an optical transmission and reception module for transmitting and receiving an optical signal, the optical transmission and reception module having internally a light emitting element for emitting a light beam for communication with a predetermined wavelength and a light receiving element for receiving the light beam. The method includes introducing a light beam of a predetermined wavelength for formation of the optical transmission device into a space area for forming the optical

transmission device within the optical transmission and reception module to harden a photosetting resin solution in an optical axis direction, inserting one end of an optical fiber through a light input/output opening of the optical transmission and reception module, and outputting the light beam of predetermined wavelength for communication by emitting light from the light emitting element.

This aspect of the method further includes detecting a quantity of output light output to the outside of the transmission and reception module via the optical fiber among the light beam of predetermined wavelength for communication that is output, adjusting a light input/output axis direction of the optical fiber such that the quantity of output light is substantially at maximum; and entering the light beam of predetermined wavelength for formation of the optical transmission device from the other end of the optical fiber into the optical transmission and reception module, while maintaining the adjusted light input/output axis direction of the optical fiber.

Unlike conventional methods, Applicant's invention includes a method of manufacturing an optical transmission device in which one of the first polymerization type and the second polymerization type includes radical polymerization, and the other includes cationic polymerization (as recited in claim 1), or in which the first irradiation has an amount of exposure more than the minimum amount of exposure required to harden the first photosetting resin substantially completely and smaller than the maximum amount of exposure not to harden the second photosetting resin completely (as recited in claim 15). In addition, Applicant's invention includes a method of forming an optical transmission device within an optical transmission and reception module, the method including introducing a light beam of a predetermined wavelength for formation of the optical transmission device into a space area for forming the optical transmission device within the optical transmission and reception module to harden a photosetting resin solution in an optical axis direction.

These novel features of the invention allow it to fabricate a cylindrical core portion of an optical transmission device more effectively and efficiently than conventional methods (Application at page 2, lines 1-7).

II. THE 35 USC §112, SECOND PARAGRAPH REJECTION

The Examiner alleges that claims 35-37 are indefinite. Applicant submits, however, that these claims are not indefinite.

Specifically, Applicant would point out that claim 35 has been amended to recite *“introducing a light beam of a predetermined wavelength for formation of the optical transmission device into a space area for forming said optical transmission device within said optical transmission and reception module to harden a photosetting resin solution in an optical axis direction”*, to address the Examiner’s concerns.

Further, Applicant respectfully disagrees with the Examiner when he states that “the entering step should introduce a second light beam...” On the contrary, Applicant would point out that claim 35 clearly sets forth the subject matter of the invention. For example, Applicant directs the Examiner’s attention to page 77, line 21-page 82, line 10 and Figures 18A-18E of the Application, which clearly explain the claimed invention.

In light of the foregoing, Applicant respectfully requests that the Examiner withdraw this rejection.

III. PRIOR ART REFERENCES

A. The Kagami Reference

The Examiner alleges that Kagami (the Japanese Patent Publication (Kokai) corresponding to U.S. Application No. 09/534,458) teaches the claimed invention. Applicant submits, however, that there are elements of the claimed invention which are neither taught nor suggested by Kagami.

Kagami discloses a method of manufacturing an optical transmission line using a photoresist solution including two sorts of mixed solutions (Kagami at [0001]).

However, contrary to the Examiner’s allegations, Kagami does not teach or suggest *“wherein one of said first polymerization type and said second polymerization type comprises radical polymerization, and the other comprises cationic polymerization”*, as recited in claim 1, nor *“wherein said first irradiation has an amount of exposure more than the minimum amount of exposure required to harden said first photosetting resin substantially completely and smaller than the maximum amount of exposure not to harden said second photosetting resin completely”*, as recited in claim 15.

Conventional methods of fabricating optical transmission devices include dipping an end of an optical fiber in a photosetting resin solution and applying a short wavelength laser (Application at page 1, lines 17-25). However, such methods find it difficult to fabricate a cylindrical core portion (Application at page 2, lines 1-7).

The claimed invention, on the other hand, includes a method of manufacturing an optical transmission device in which one of the first polymerization type and the second polymerization type includes radical polymerization, and the other includes cationic polymerization (Application at page 37, line 21-page 39, line 21; page 42, line 9-page 43, line 4; Figures 1A-1D). Another aspect of the invention includes a method in which the first irradiation has an amount of exposure more than the minimum amount of exposure required to harden the first photosetting resin substantially completely and smaller than the maximum amount of exposure not to harden the second photosetting resin completely (Application at page 43, line 5-page 47, line 8).

Clearly, Kagami does not teach or suggest these novel features. Kagami merely discloses a mixed solution including a 2nd photoresist solution with a hardening start wavelength shorter than the 1st photoresist solution (Kagami at paragraphs [0007]).

In fact, nowhere does Kagami teach or suggest two photosetting resins having different polymerization mechanisms between a first polymerization type and a second polymerization type. Certainly, Kagami does not teach or suggest one of the first polymerization type and the second polymerization type includes radical polymerization, and the other includes cationic polymerization.

The Examiner attempts to rely on paragraph [0034] to support his allegations. However, this passage merely describes a "mixed solution" consisting of solution A having a high refractive index n_{A1} , and solution B having a low refractive index n_{B1} . Kagami further states that if these solutions are mixed at a certain ratio, the mixed solution will have a refractive index n_{C1} which falls somewhere between n_{A1} and n_{B1} (Kagami at paragraph [0035]).

However, nowhere does Kagami teach or suggest that the solution A and B should have different polymerization mechanisms. Instead, as noted above, Kagami merely states that one of the photoresist solutions should have a hardening start wavelength shorter than the other photoresist solution (Kagami at paragraphs [0036]).

Further, nowhere does Kagami teach or suggest amounts of irradiation exposure for setting first and second photosetting resins. Certainly, Kagami does not teach or suggest the first irradiation has an amount of exposure more than the minimum amount of exposure required to harden the first photosetting resin substantially completely and smaller than the maximum amount of exposure not to harden the second photosetting resin completely. In fact, Applicant would point out that the Examiner did not even address this feature in the Office Action. Therefore, presumably the Examiner did not find this feature in the Kagami reference.

Therefore, Applicant submits that there are elements of the claimed invention that are not taught or suggested by Kagami. Therefore, the Examiner is respectfully requested to withdraw this rejection.

B. The '458 Application

The Examiner alleges that the '458 Application teaches the claimed invention of claims 1-28. Applicant notes that since the '458 Application has not been published, Applicant has no way of knowing with certainty, the content of the '458 Application. However, Applicant notes that the '458 Application is the U. S. counterpart to the JP '043 Application. Therefore, for the purposes of responding to Examiner's allegations, Applicant has assumed that the disclosure of the '458 Application is substantially the same as the disclosure of the JP '043 Application.

Applicant submits that, contrary to the Examiner's allegations, there are elements of the claimed invention which are neither taught nor suggested by the '458 Application.

Specifically, the '458 Application does not teach or suggest "*wherein one of said first polymerization type and said second polymerization type comprises radical polymerization, and the other comprises cationic polymerization*", as recited in claim 1, nor "*wherein said first irradiation has an amount of exposure more than the minimum amount of exposure required to harden said first photosetting resin substantially completely and smaller than the maximum amount of exposure not to harden said second photosetting resin completely*", as recited in claim 15.

Applicant notes that the arguments made above with respect to Kagami are equally applicable here and are, therefore, incorporated herein by reference. Specifically, like

Kagami, the '458 Application does not teach or suggest two photosetting resins having different polymerization mechanisms between a first polymerization type and a second polymerization type. Certainly, the '458 Application does not teach or suggest one of the first polymerization type and the second polymerization type includes radical polymerization, and the other includes cationic polymerization.

Further, nowhere does Kagami teach or suggest amounts of irradiation exposure for setting first and second photosetting resins. Certainly, Kagami does not teach or suggest the first irradiation has an amount of exposure more than the minimum amount of exposure required to harden the first photosetting resin substantially completely and smaller than the maximum amount of exposure not to harden the second photosetting resin completely.

Therefore, Applicant submits that there are elements of the claimed invention that are not taught or suggested by the '458 Application. Therefore, the Examiner is respectfully requested to withdraw this rejection.

C. The JP '422 and Anderson References

The Examiner alleges that JP '422 would have been combined with Anderson to form the claimed invention of claims 35-37. Applicant submits, however, that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

The JP '422 reference discloses a method of forming a waveguide, and a refractive-index distribution and an optical coupling by self-organization (JP '422 at Abstract).

Anderson discloses an optical pigtail assembly in which the focusing lens through which the laser diode output is passed has its planar surface facing the laser instead of its convex surface. In the method of manufacturing the optical pigtail assembly, ultraviolet, UV, cured epoxy is used to bond the elements of the pigtail assembly together (Anderson at Abstract).

However, Applicant submits that these references would not have been combined as alleged by the Examiner. Indeed, these references are directed to different problems and solutions. Specifically, JP '422 is directed to a method of forming a waveguide, whereas Anderson is merely directed to an optical pigtail assembly. Therefore, these references are

completely unrelated, and no person of ordinary skill in the art would have considered combining these disparate references, absent impermissible hindsight.

Further, Applicant submits that the Examiner can point to no motivation or suggestion in the references to urge the combination as alleged by the Examiner. Indeed, the Examiner merely states that it would have been obvious to maximize coupling efficiency. However, one of ordinary skill in the art would not have been so motivated as alleged by the Examiner. Therefore, the Examiner has failed to make a prima facie case of obviousness.

Moreover, neither the JP '422 reference, nor Anderson, nor any combination thereof teaches or suggests a method for forming an optical transmission device within an optical transmission and reception module, let alone a method which includes *“introducing a light beam of a predetermined wavelength for formation of the optical transmission device into a space area for forming said optical transmission device within said optical transmission and reception module to harden a photosetting resin solution in an optical axis direction”*, as recited for example, in claim 35.

Clearly, these features are not taught or suggested by the cited references. Indeed, as noted above, JP '422 is merely directed to a method of forming a waveguide. Nowhere does JP '422 teach or suggest forming an optical transmission device within an optical transmission and reception module, let alone a method which includes introducing a light beam into a space area for forming the optical transmission device within the module to harden a photosetting resin solution. Therefore, JP '422 is completely unrelated to the claimed invention.

Likewise, Anderson is merely directed to a method of forming an optical pigtail assembly. Like JP '422, nowhere does Anderson teach or suggest forming an optical transmission device within an optical transmission and reception module, let alone a method which includes introducing a light beam into a space area for forming the optical transmission device within the module to harden a photosetting resin solution.

Therefore, Anderson is completely unrelated to the claimed invention. Thus, Anderson fails to make up for the deficiencies of JP '422.

Further, Applicant would again point out that the Examiner did not even address this feature in the Office Action. Therefore, presumably the Examiner did not find these features in the JP '422 reference or the Anderson reference.

The Examiner also secondarily alleges that an JP '422/Anderson combination would have been modified by Kagami to form the claimed invention.

Applicant submits that Kagami is completely unrelated to the JP '422 reference and Anderson and therefore, would not have been combined as alleged by the Examiner. Further, the Examiner has failed to identify anything in these references that would provide some motivation or suggestion to combine the references as alleged by the Examiner.

Moreover, neither JP '422, nor Anderson, nor Kagami, nor any combination thereof, teaches or suggests a method for forming an optical transmission device within an optical transmission and reception module, let alone a method which includes *“introducing a light beam of a predetermined wavelength for formation of the optical transmission device into a space area for forming said optical transmission device within said optical transmission and reception module to harden a photosetting resin solution in an optical axis direction”*, as recited for example, in claim 35.

Clearly, Kagami, like JP '422 and Anderson, does not teach or suggest these novel features. Indeed, Kagami merely discloses a method of manufacturing an optical transmission line using a photoresist solution including two sorts of mixed solutions. Nowhere does Kagami teach or suggest forming an optical transmission device within an optical transmission and reception module, let alone a method which includes introducing a light beam into a space area for forming the optical transmission device within the module to harden a photosetting resin solution. Therefore, Kagami does not make up for the deficiencies of the alleged JP '422/Anderson combination.

Therefore, Applicant submits that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention. Therefore, the Examiner is respectfully requested to withdraw this rejection.

IV. THE PROVISIONAL OBVIOUSNESS-TYPE DOUBLE PATENTING REJECTION OVER CLAIMS 1-8 AND 11 OF U.S. PAT. APP. NO. 09/534,458

Claims 1-28 also stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-8 and 11 of the '458 Application. The Examiner further alleges that claims 1-28 conflict with claims 1-8 and 11 of

the '458 Application. He also indicates that claims 1-28 are directed to the same invention as that of claims 1-8 and 11 of the '458 Application.

As noted above, since the '458 Application has not been published, Applicant has no way of knowing with certainty, the content of the '458 Application, including the claims. However, for the purposes of responding the Examiner's argument, Applicant has assumed that the claims of the '458 Application are substantially the same as the claims of the JP '043 Application.

Contrary to the Examiner's allegations, there are elements of the claimed invention that are not taught or suggested by claims 1-8 and 11 of the '458 Application. Specifically, these claims of the '458 Application do not teach or suggest "*wherein one of said first polymerization type and said second polymerization type comprises radical polymerization, and the other comprises cationic polymerization*", as recited in claim 1, nor "*wherein said first irradiation has an amount of exposure more than the minimum amount of exposure required to harden said first photosetting resin substantially completely and smaller than the maximum amount of exposure*", as recited in claim 15.

Moreover, Applicant would point out to the Examiner that the present Application is assigned to Toyoda Gosei Co., Ltd., whereas U. S. Pat. App. Ser. No. 09/534,458 is assigned to Toyota Choo Kenkyusho, **and not** Toyoda Gosei Co., Ltd. Therefore, these applications are not "commonly assigned" as alleged by the Examiner. Therefore, there is no double patenting issue in this case.

Further, regarding Item No. 14 of the Office Action, the Examiner requires priority to be resolved in this case and U.S. Application No. '458. However, Applicant submits that the claims clearly are different. Thus, priority need not be resolved at this time.

Therefore, Applicant submits that there are elements of the claimed invention that are not taught or suggested by claims 1-8 and 11 of the '458 Application, and moreover, these applications are not commonly assigned. Therefore, the Examiner is respectfully requested to withdraw this rejection.

V. FORMAL MATTERS AND CONCLUSION

In view of the foregoing, Applicant submits that claims 1-28 and 35-39, all the claims presently pending in the application, are patentably distinct over the prior art of record and are

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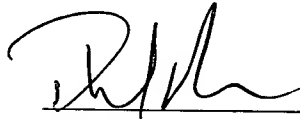
in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

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